

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
December 30, 2014

Prepared by
Center for Toxicology and Environmental Health, L.L.C. (CTEH®)

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vacuum truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for December 30, 2014 07:00 to December 31, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for ammonia (NH₃), chlorine (Cl₂), hydrogen sulfide (H₂S), hydrochloric acid (HCl), percent of the Lower Explosive Limit (LEL), oxygen (O₂), peroxides, particulate matter (10 micron particles, PM₁₀), sulfur dioxide (SO₂), sulfuric acid (H₂SO₄), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems® AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. Additional units (Unit 09 and Unit 10) were deployed in the cabs of excavators supporting solidification operations in the Exclusion Zone. AreaRAEs were equipped with sensors to detect Cl₂, VOCs, LEL, H₂S, and SO₂. Unit 10 recorded detections of Cl₂ up to 1.6 ppm and SO₂ up to 0.6 ppm. Excavator operators at these locations were in air-purifying respirators (APRs) during this period. Table 2 summarizes monitoring data for AreaRAE monitoring. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Particulate monitors were collocated with AreaRAE units 01, 02, 03, and 04 and data-logged to monitor PM₁₀. Additional monitors were data-logged in the cabs of excavators supporting solidification operations in the exclusion zone. The monitor deployed with AreaRAE Unit 03 recorded one instantaneous detection of 4.37 mg/m³ at 20:23 on 12/30, which was above the action level of 3 mg/m³. This concentration was not sustained. Table 3 summarizes data-logged particulate monitoring data.

Table 1: Manually-Logged Real-Time Air Monitoring Summary¹
December 30, 2014 07:00 – December 31, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Community	Cl ₂	Gastec 8La	5	0	NA	<0.05 ppm
	H ₂ S	MR+ / MR Pro	24	0	NA	<0.1 ppm
	HCl	Gastec 14L	6	0	NA	<0.05 ppm
	LEL	MR+ / MR Pro	24	0	NA	<1 %
	O ₂	MR+ / MR Pro	31	31	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	5	0	NA	<0.1 ppm
	PM ₁₀	AM510/Dusttrak	22	22	0.02	0.012 - 0.032 mg/m ³
	SO ₂	MR+ / MR Pro	24	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	4	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	32	0	NA	<0.1 ppm
Exclusion Zone	Cl ₂	MR+ / MR Pro	2	1	0.1	0.1 - 0.1 ppm
	VOC	MR+ / MR Pro	2	1	0.2	0.2 - 0.2 ppm
Work Area	Cl ₂	Gastec 8La	4	2	0.05	0.05 - 0.05 ppm
		MR+ / MR Pro	28	2	0.05	0.05 - 0.05 ppm
	H ₂ S	MR+ / MR Pro	23	0	NA	<1 ppm
	LEL	MR+ / MR Pro	26	0	NA	<1 %
	NH ₃	Gastec 3L	5	0	NA	<0.2 ppm
	O ₂	MR+ / MR Pro	21	21	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	3	0	NA	<0.1 ppm
	SO ₂	MR+ / MR Pro	24	0	NA	<0.1 ppm
	H ₂ SO ₄	Gastec 35	3	0	NA	<0.2 mg/m ³
	VOC	MR+ / MR Pro	30	1	0.1	0.1 - 0.1 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 2: AreaRAE Air Monitoring Summary¹
December 30, 2014 07:00 – December 31, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range ²
Unit 01	H ₂ S	5224	1	0.1 ppm	0.1 - 0.1 ppm
	LEL	5224	0	NA	< 1 %
	SO ₂	5224	0	NA	< 0.1 ppm
	VOC	5224	0	NA	< 0.1 ppm
Unit 02	H ₂ S	5223	0	NA	< 1 ppm
	LEL	5223	0	NA	< 1 %
	SO ₂	5223	0	NA	< 0.1 ppm
	VOC	5223	18	0.1 ppm	0.1 - 0.1 ppm
Unit 03	H ₂ S	5220	435	0.4 ppm	0.1 - 0.7 ppm
	LEL	5220	0	NA	< 1 %
	SO ₂	5220	1	0.1 ppm	0.1 - 0.1 ppm
	VOC	5220	0	NA	< 0.1 ppm
Unit 04	H ₂ S	4960	228	0.1 ppm	0.1 - 0.2 ppm
	LEL	4960	0	NA	< 1 %
	SO ₂	4960	0	NA	< 0.1 ppm
	VOC	4960	0	NA	< 0.1 ppm
Unit 09	Cl ₂	1502	0	NA	< 0.1 ppm
	SO ₂	1502	0	NA	< 0.1 ppm
	VOC	1502	5	0.2 ppm	0.1 - 0.3 ppm
Unit 10	Cl ₂	6707	803	0.2 ppm	0.1 - 1.6 ppm
	SO ₂	6707	7	0.4 ppm	0.2 - 0.6 ppm
	VOC	6707	761	0.4 ppm	0.1 - 0.8 ppm

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

²Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.

Table 3: AM510 PM₁₀ Monitoring Summary¹
December 30, 2014 07:00 – December 31, 2014 07:00

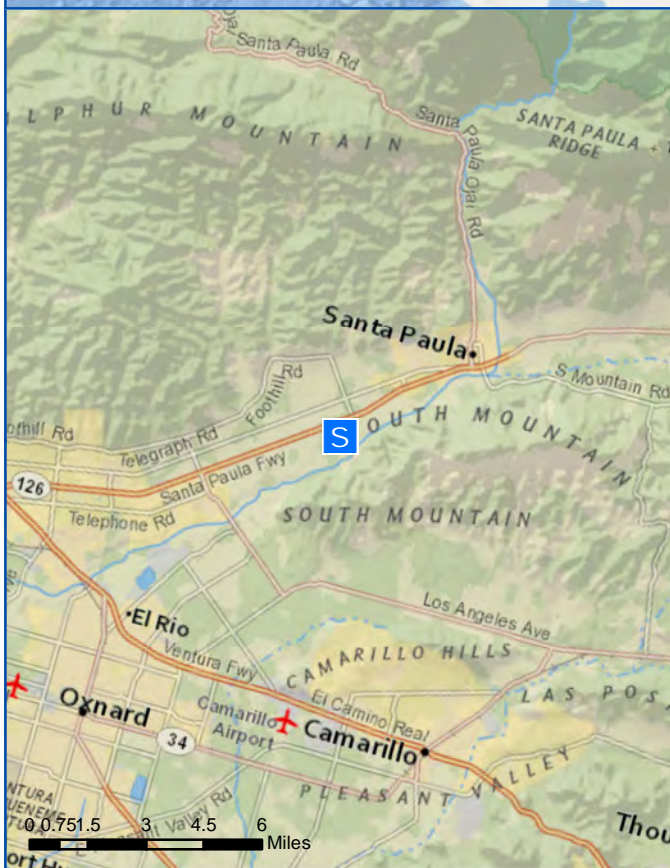
Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10601072	AR01	4187	4187	0.007	0.001 - 0.3 mg/m ³
10503020	AR02	5412	5398	0.027	0.001 - 0.993 mg/m ³
10704075	AR03	16778	16778	0.046	0.009 - 4.37 mg/m ³
10704074	AR04	5617	5009	0.018	0.001 - 0.235 mg/m ³
10408087	AR09 - Excavator 210G	907	907	0.266	0.051 - 0.623 mg/m ³
10901027	AR10 - Excavator 200D	2027	2027	0.035	0.004 - 0.683 mg/m ³

¹Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.

Appendix A

Incident Maps:

Real-time Air Monitoring Locations and Incident Site



Legend

S Site Location

0 50 100 Feet





Fixed Community Real-Time Air Monitoring Station Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

0 250 500 1,000
Feet



Legend

- FRT Location
- Site Location







Legend

Monitoring Location

- Non-detect (< 0.05 ppm)
- S Incident Site

0 0.125 0.25 0.5 Miles



Manually Logged Real-Time Air Monitoring Concentrations

LEL - Dec 30, 2014 07:00 to Dec 31, 2014 07:00



CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: UTM13N COORDINATE SYSTEM: WGS84

Print Date: 12/31/2014 7:37:44 AM





Legend

Monitoring Location

- Detect (20.9 %)
- S Incident Site









Legend

Monitoring Location

- Non-detect (< 0.2 mg/m³)
- S Incident Site

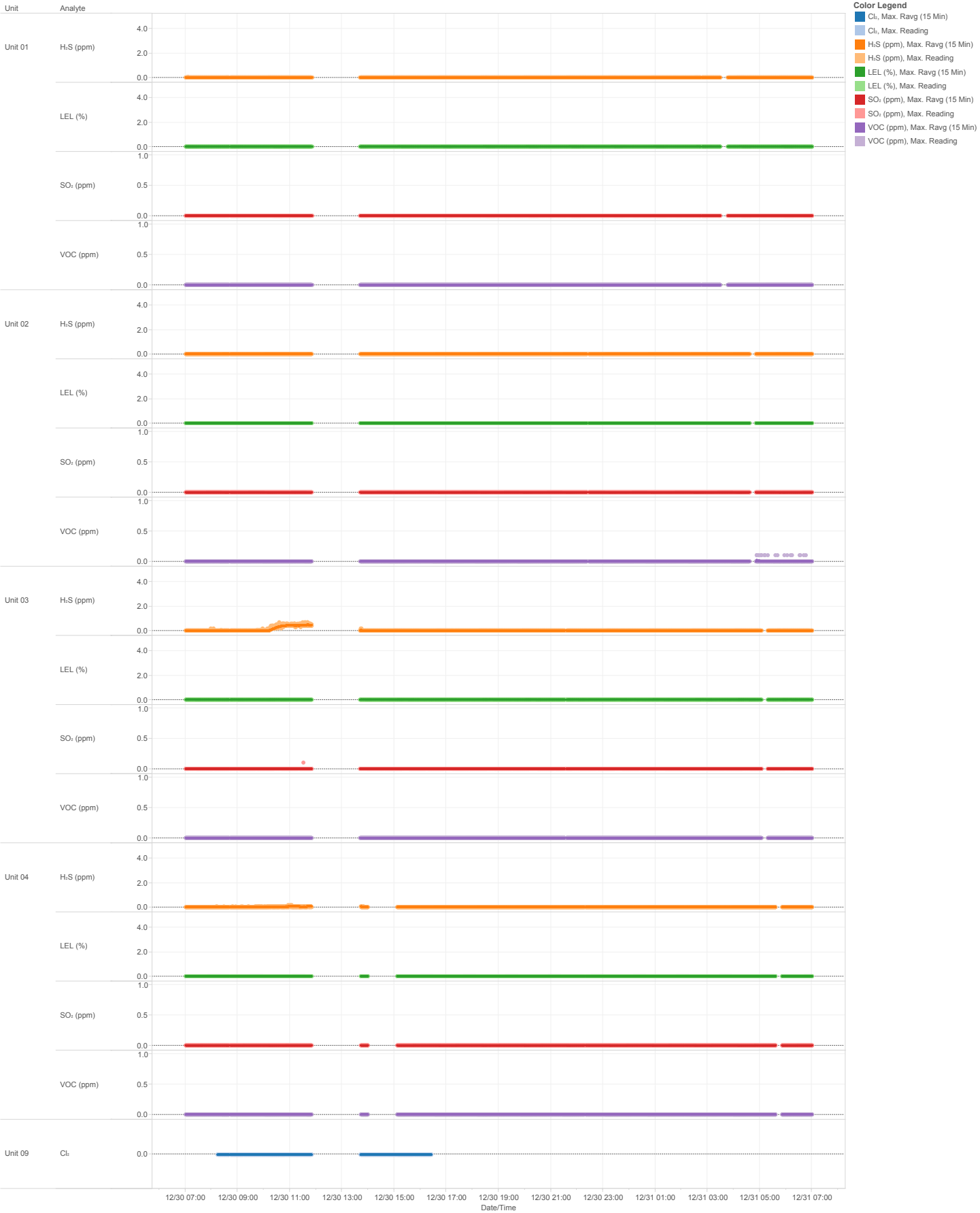


Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and Location Map

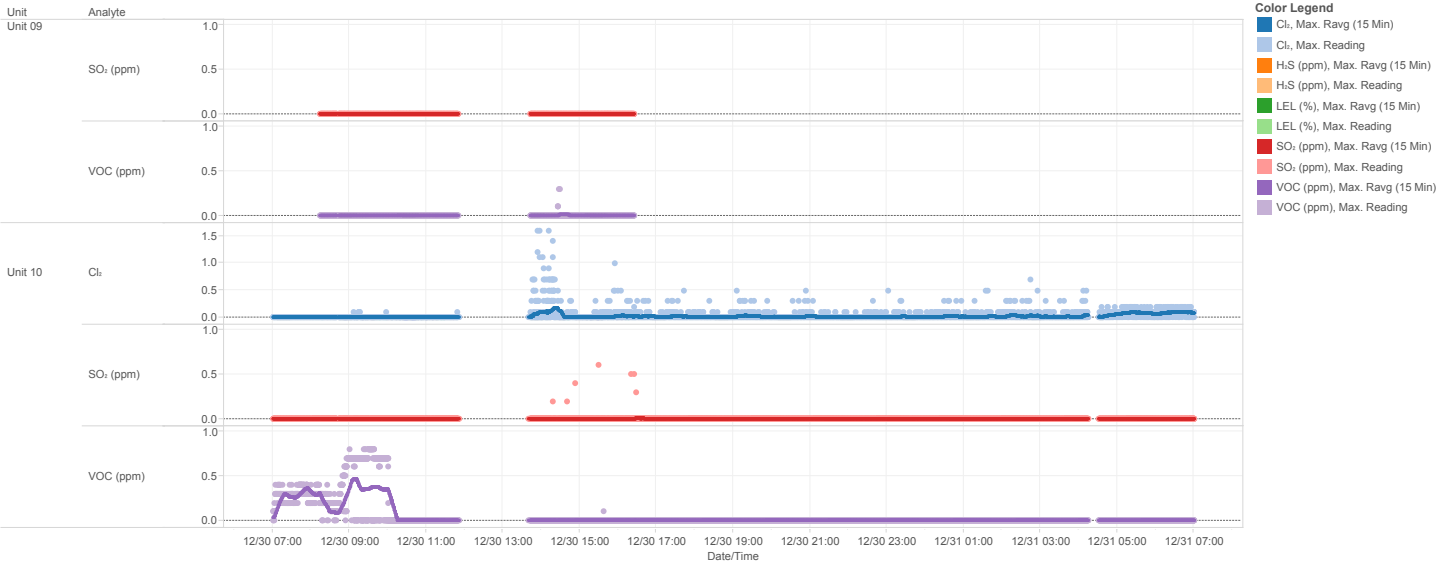


Patriot Environmental
AreaRAE Trend Graphs
12/30/2014 07:00 - 12/31/2014 07:00



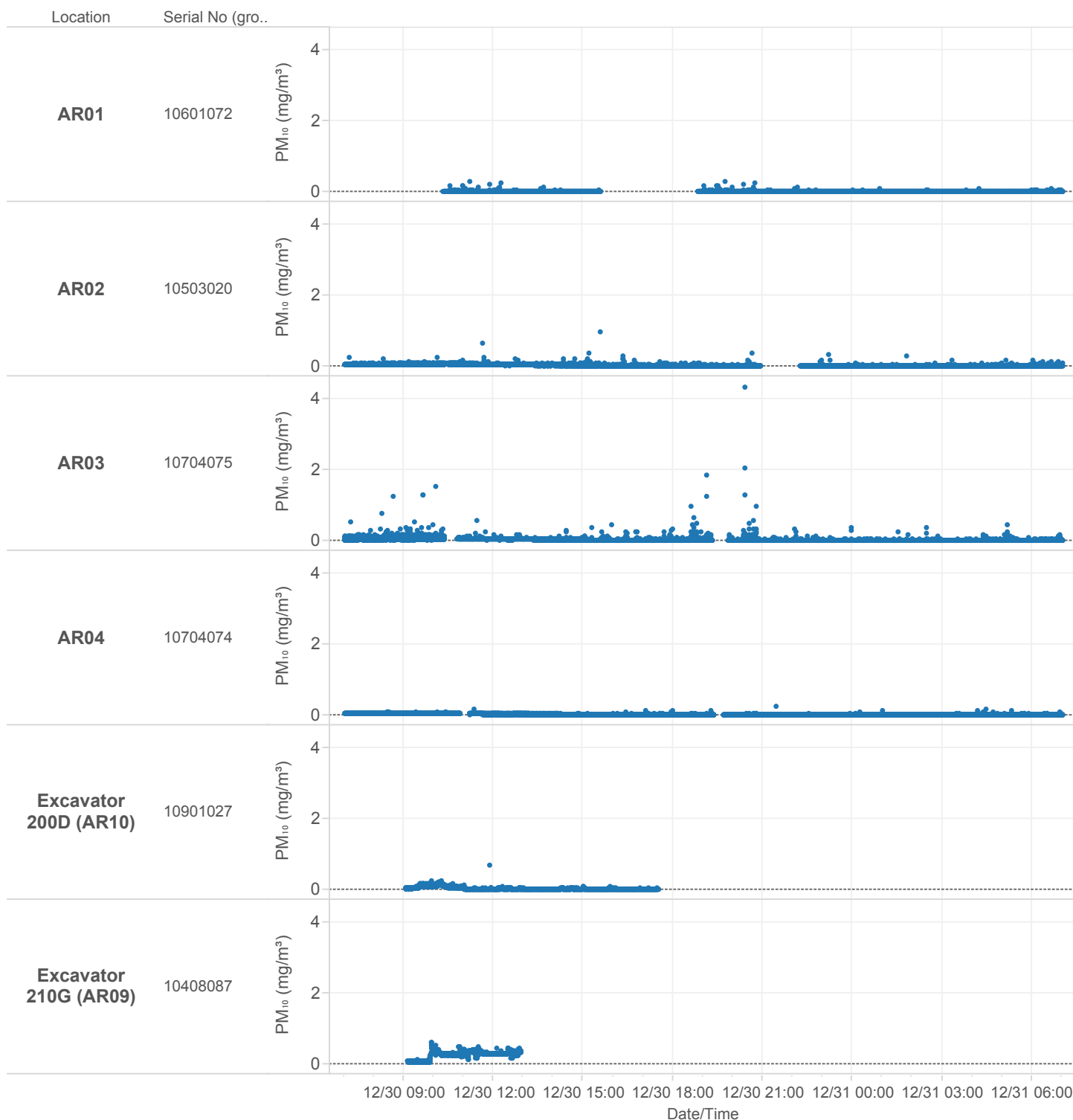
- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
AreaRAE Trend Graphs
12/30/2014 07:00 - 12/31/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 (PM₁₀) Summary
12/30/2014 07:00 - 12/31/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format